

### Warm Up #11-3

Find the general term,  $u_n$ , for the following sequences: (hint: think of  $d$  = slope)

1.  $u_7 = 41$  &  $u_{13} = 77$

2. 5<sup>th</sup> term is -2  
12<sup>th</sup> term is -12.5

HW Questions:

5a)  $u_n = 3n - 2$       $u_1 = 1$       $d = 4 - 1 = 3$   
                                   $u_2 = 4$       $d = 7 - 4 = 3$   
                                   $u_3 = 7$

7f)  $2k+18, -2-k, 2k+2$

$$\begin{aligned}
 -2-k-(2k+18) &= 2k+2-(-2-k) \\
 \underline{-2-k-2k-18} &= \underline{2k+2+2+k} \\
 -20-3k &= 3k+4 \\
 +3k &+3k \\
 -20 &= 6k+4 \\
 -4 &-4 \\
 \frac{-24}{6} &= \frac{6k}{6} \\
 k &= -4
 \end{aligned}$$

Geometric Sequences $r$  = common ratio

Ex: 2, 10, 50, 250,...

$$r = \frac{\text{any term}}{\text{previous}}$$

$$r = \frac{10}{2} = 5$$

$$r = \frac{50}{10} = 5$$

The general term:

$$u_2 = u_1 r$$

$$u_3 = u_2 r$$

$$u_4 = u_3 r$$

$$u_3 = u_1 r \cdot r \quad u_4 = u_1 r^2 \cdot r$$

$$u_2 = u_1 r^1 \quad u_3 = u_1 r^2 \quad u_4 = u_1 r^3$$

$$u_n = u_1 r^{n-1}$$

$$u_n = u_1 r^{n-1}$$

Ex: 8, 4, 2, ...

$$r = \frac{4}{8} = \frac{1}{2}$$

Find the general term and hence find the  $7^{\text{th}}$  term.

$$u_n = 8 \left( \frac{1}{2} \right)^{n-1}$$

$$u_7 = 8 \left( \frac{1}{2} \right)^6$$

$$u_7 = 8 \left( \frac{1}{64} \right)$$

$$u_7 = \frac{1}{8}$$

Show the sequence is geometric:

$$8, 4\sqrt{2}, 4, 2\sqrt{2}, \dots$$

$$r = \frac{4\sqrt{2}}{8} = \frac{\sqrt{2}}{2}$$

$$r = \frac{4}{4\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2}$$

$$r = \frac{2\sqrt{2}}{4} = \frac{\sqrt{2}}{2} \quad \checkmark \quad \text{☺}$$

Arithmetic mean

consec. terms

$$a, b, c, \dots$$

$$\begin{array}{ccccc} b & - & a & = & c & - & b \\ + & b & + & a & & + & a & + & b \end{array}$$

$$\frac{2b}{2} = \frac{a+c}{2}$$

$$b = \frac{a+c}{2}$$

Geometric Mean

consec. terms

$$a, b, c, \dots$$

$$\frac{b}{a} = \frac{c}{b}$$

$$\sqrt{b^2} = \sqrt{ac}$$

$$b = \sqrt{ac}$$

Classwork: 5D.1 p. 136,  
# 1 - 3 (part b only for each)  
5, 6, 8, 9ab

HW: IB Exam Practice  
(from 2014 Mock Paper 1)